E95 TRACKING ERROR OF SIMULATED WAVEMETER

TRACKING RESIDUALS SAM + HR LAM VARIANCE = 7.3 fm

SAM: 0.12 pm FWHM bandpass
20 pixels in FWHM
800 pixel inspection range
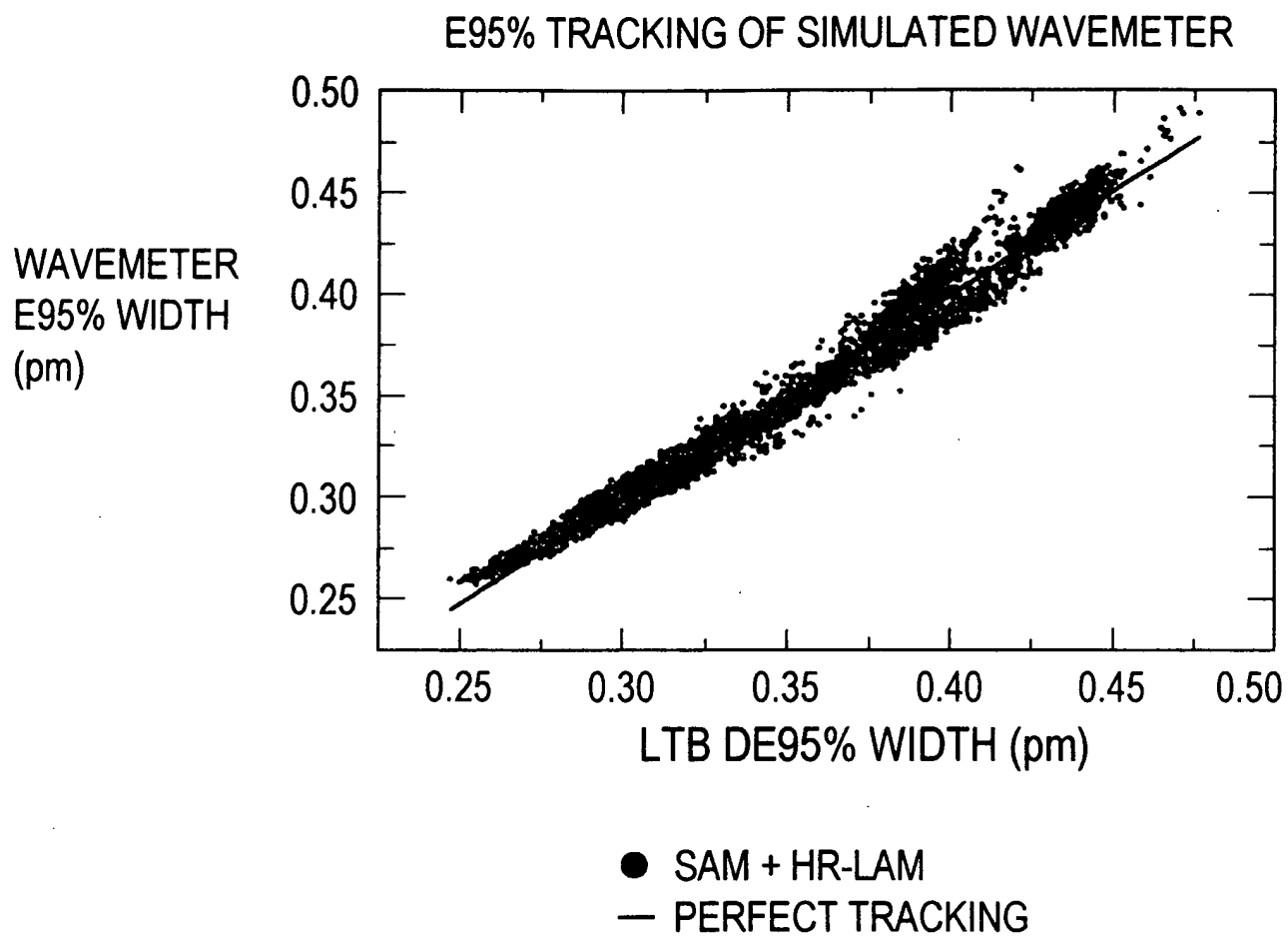
HRLAM: 0.70 pm FWHM bandpass
20 pixels in FWHM
800 pixel inspection range

6 pilot XLA-130 lasers
4814 spectra from Bandwidth Resonance scans

FIG. 8

E95% TRACKING OF SIMULATED WAVEMETER

WAVEMETER E95% WIDTH (pm)

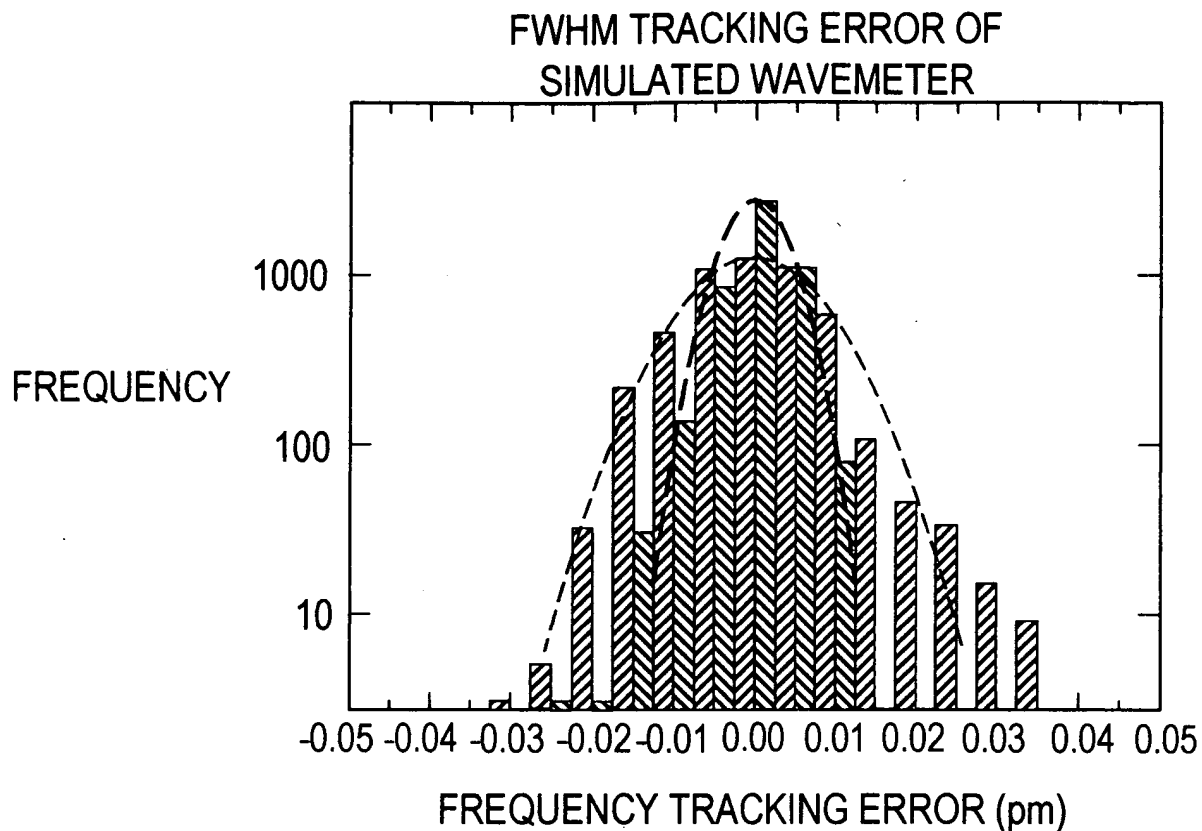LTB DE95% WIDTH (pm)

● SAM + HR-LAM
— PERFECT TRACKING

SAM: 0.12 pm FWHM bandpass
20 pixels in FWHM
800 pixel inspection range

HRLAM: 0.70 pm FWHM bandpass
20 pixels in FWHM
800 pixel inspection range

6 pilot XLA-130 lasers
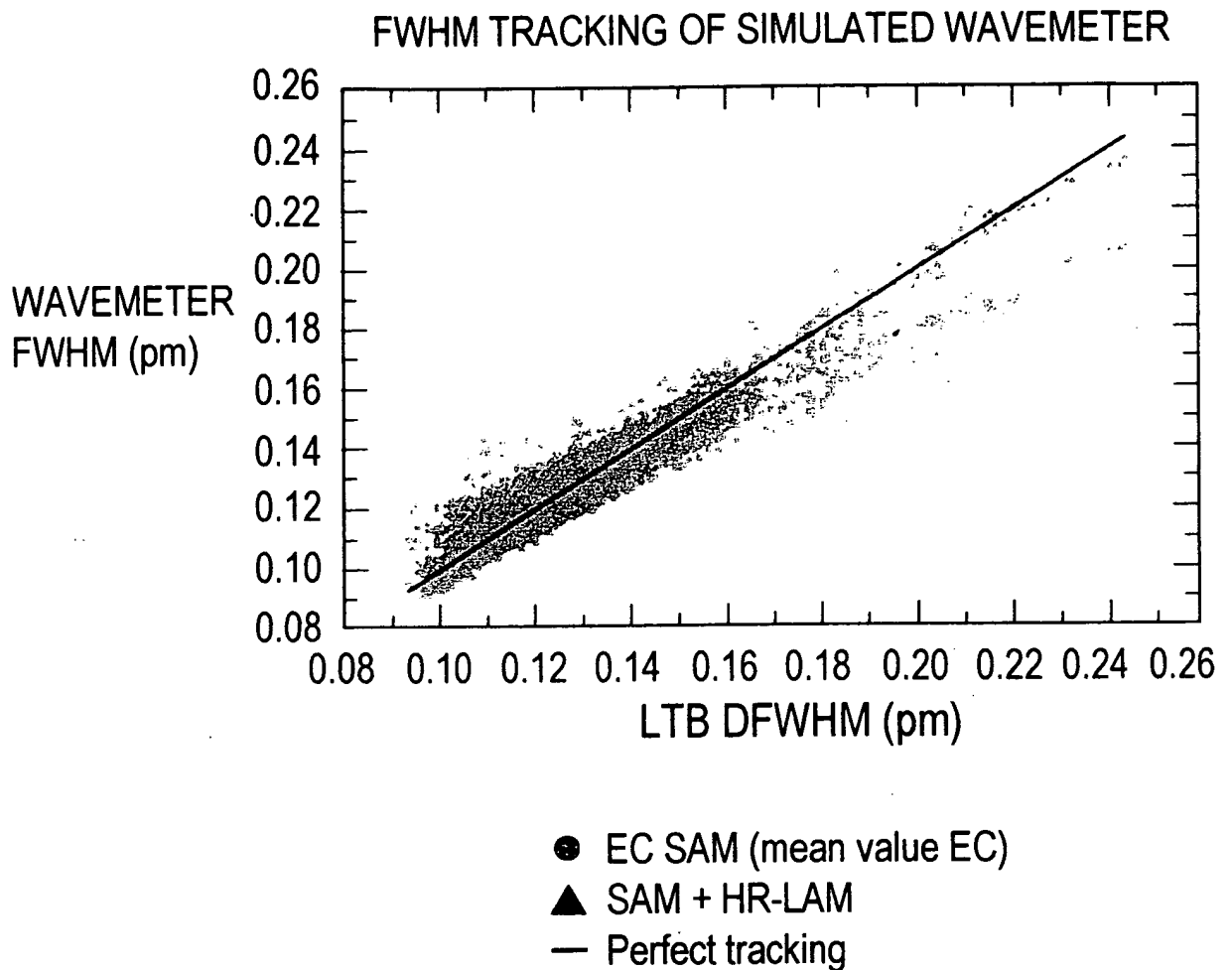4814 spectra from Bandwidth Resonance scans

FIG. 7

FWHM TRACKING ERROR OF SIMULATED WAVEMETER

FREQUENCY

1000

100

10

-0.05 -0.04 -0.03 -0.02 -0.01 0.00 0.01 0.02 0.03 0.04 0.05

FREQUENCY TRACKING ERROR (pm)

▨▨▨ TRACKING RESIDUALS EC SAM VARIANCE = 7.9 fm

▧▧▧ TRACKING RESIDUALS SAM + HR LAM VARIANCE = 3.9 fm

SAM: 0.12 pm FWHM bandpass
20 pixels in FWHM
800 pixel inspection range

HRLAM: 0.70 pm FWHM bandpass
20 pixels in FWHM
800 pixel inspection range

6 pilot XLA-130 lasers
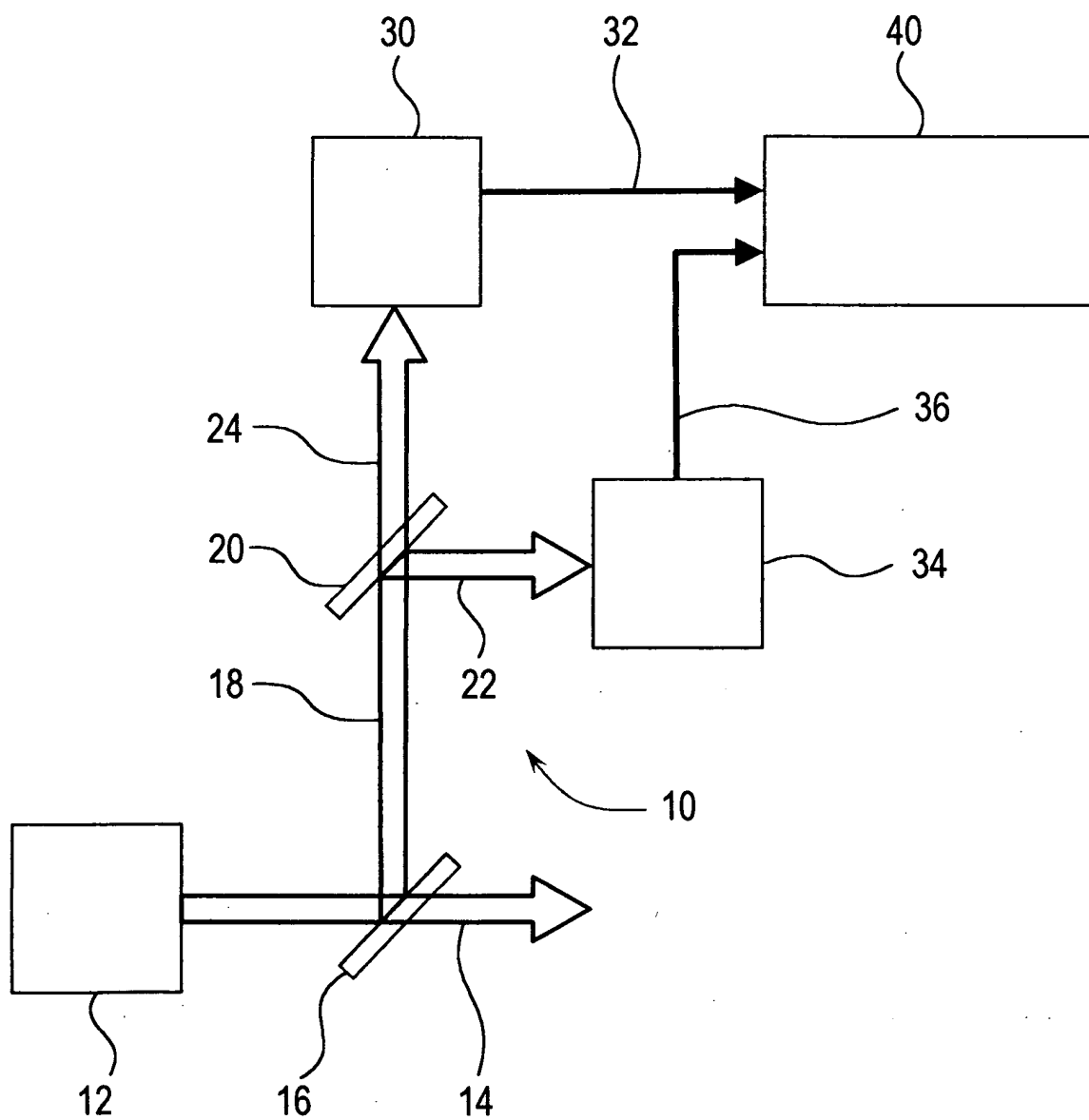4814 spectra from Bandwidth Resonance scans

FIG. 6

FWHM TRACKING OF SIMULATED WAVEMETER

● EC SAM (mean value EC)
▲ SAM + HR-LAM
— Perfect tracking

SAM: 0.12 pm FWHM bandpass
20 pixels in FWHM
800 pixel inspection range

HRLAM: 0.70 pm FWHM bandpass
20 pixels in FWHM
800 pixel inspection range

6 pilot XLA-130 lasers
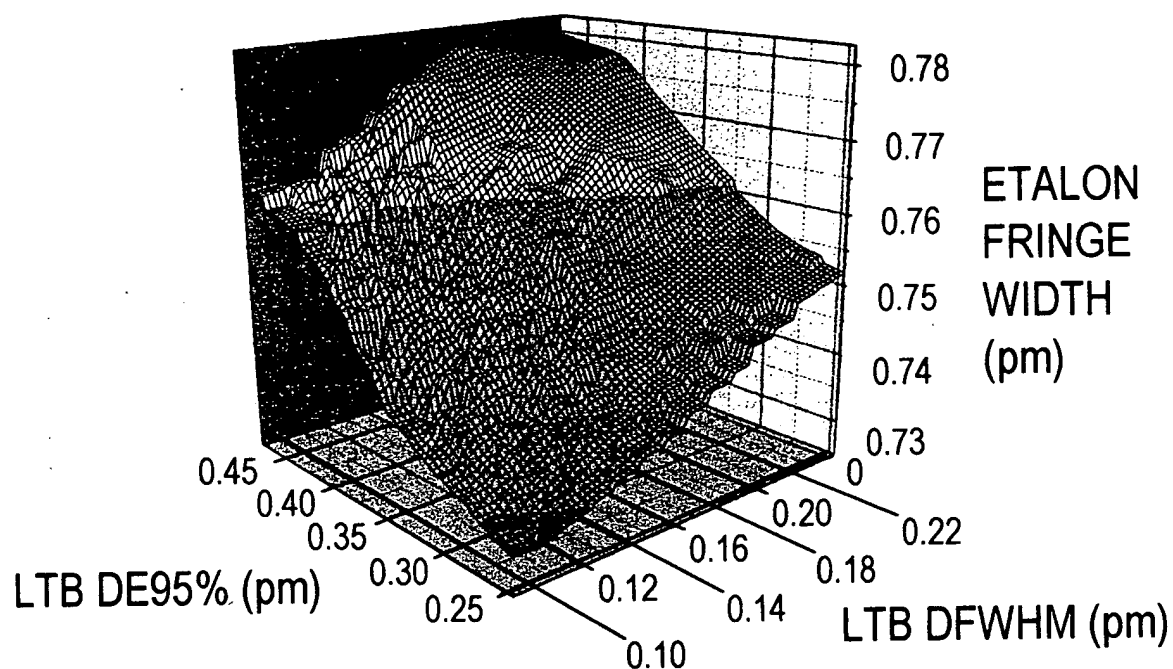4814 spectra from Bandwidth Resonance scans

FIG. 5

FIG. 4

HiRes LAM Tracking Simulation 0.7 pm/20 pixel Bandpass

Data: Data5_HRLAM
Model: 3Dplane
Equation: A*x + B*y + C
Weighting:
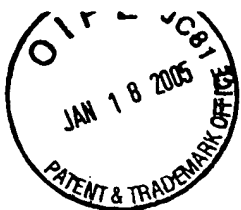Z   No weighting

Chi^ 2/DoF = 2.0666E-6
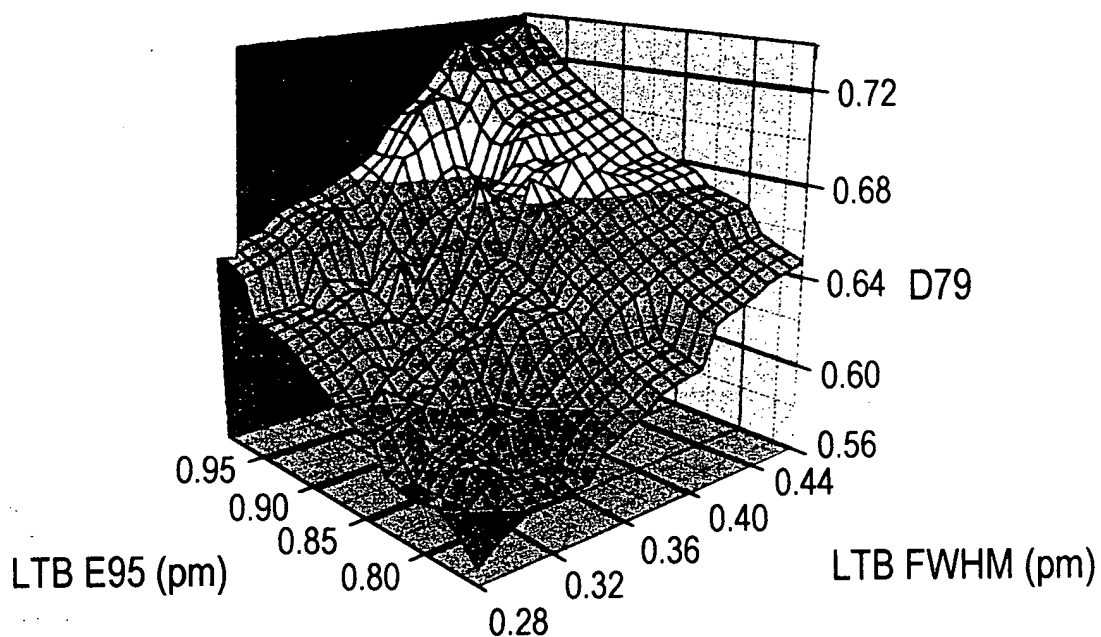R^ 2   = 0.97507

A 0.14483 ±000114
B 0.16575 ±0.00041
C 0.67263 ±0.0002

FIG. 3

Avg Behavior of D79 (28-36)/380 kPa
Correlation gridding, WM5645 ultralow wedge etalon

Data: Data2_D79
Model: 3Dplane
Equation: A*x + B*y + C
Weighting:
Z   No weighting

Chi^ 2/DoF = 0.00008
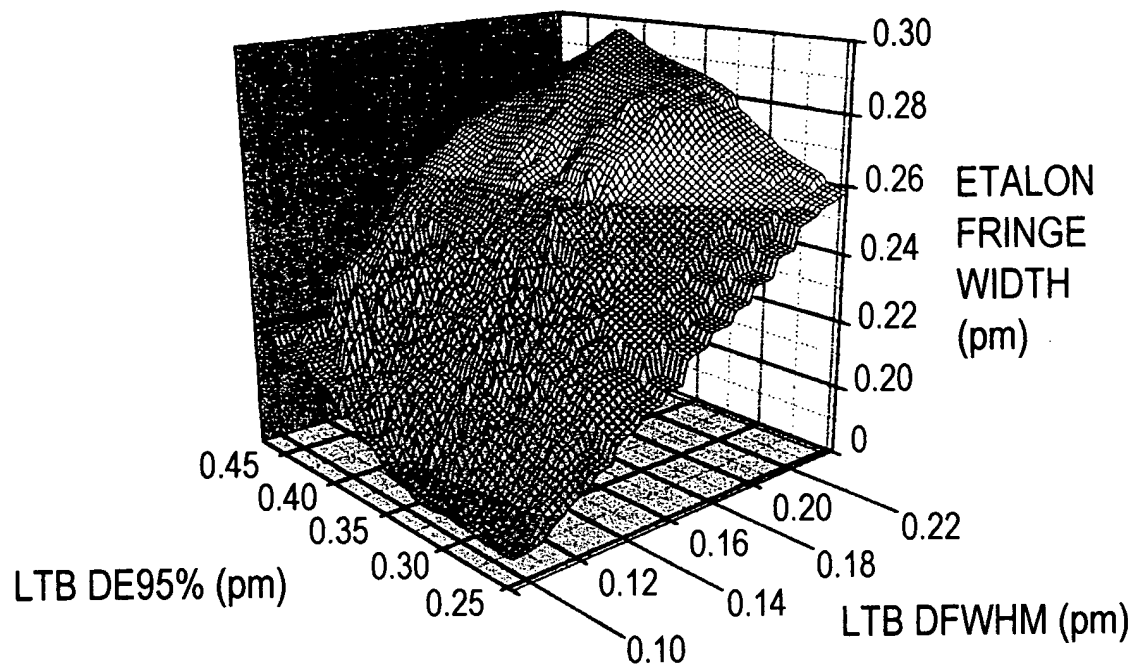R^ 2   = 0.89623

A   0.64495   ±0.0166
B   0.20797   ±0.01105
C   0.22983   ±0.00719

FIG. 1

SAM Tracking Simulation 0.12 pm/20 pixel Bandpass

Data: Data5_SAM
Model: 3Dplane
Equation: A*x + B*y + C
Weighting:
Z   No weighting
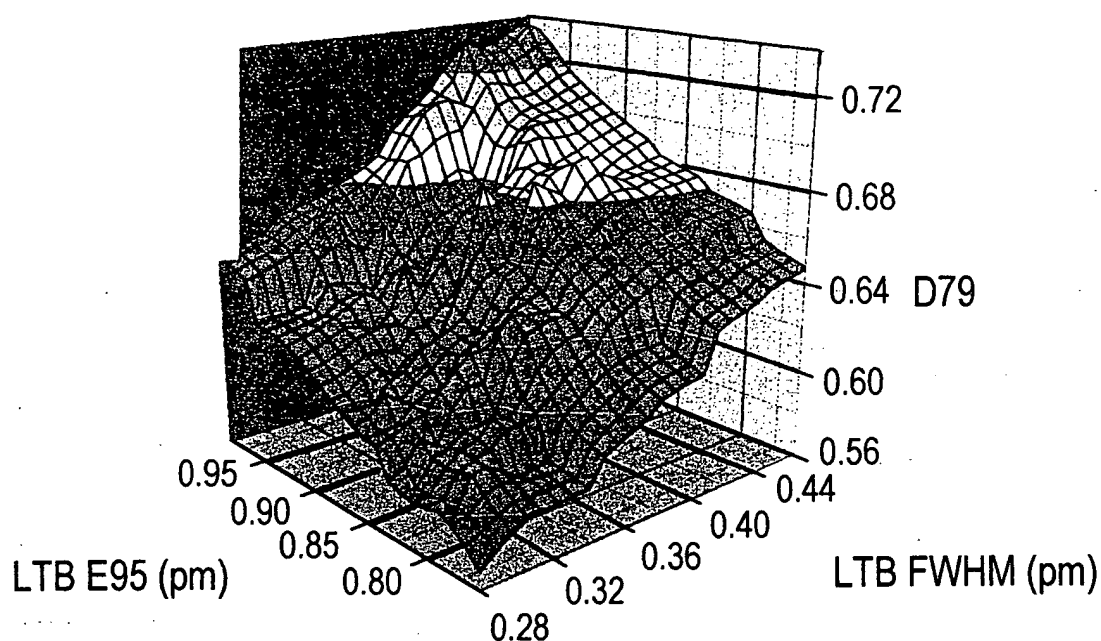
Chi^2/DoF = 7.8249E-6
R^2   = 0.95716

A 0.66704 ±0.00221
B 0.08951 ±0.00079
C 0.10172 ±0.00039

FIG. 2

Avg Behavior of D79 (28-36)/380 kPa
Correlation gridding, WM5645 ultralow wedge etalon

Data: Data2_D79
Model: 3Dplane
Equation: A*x + B*y + C
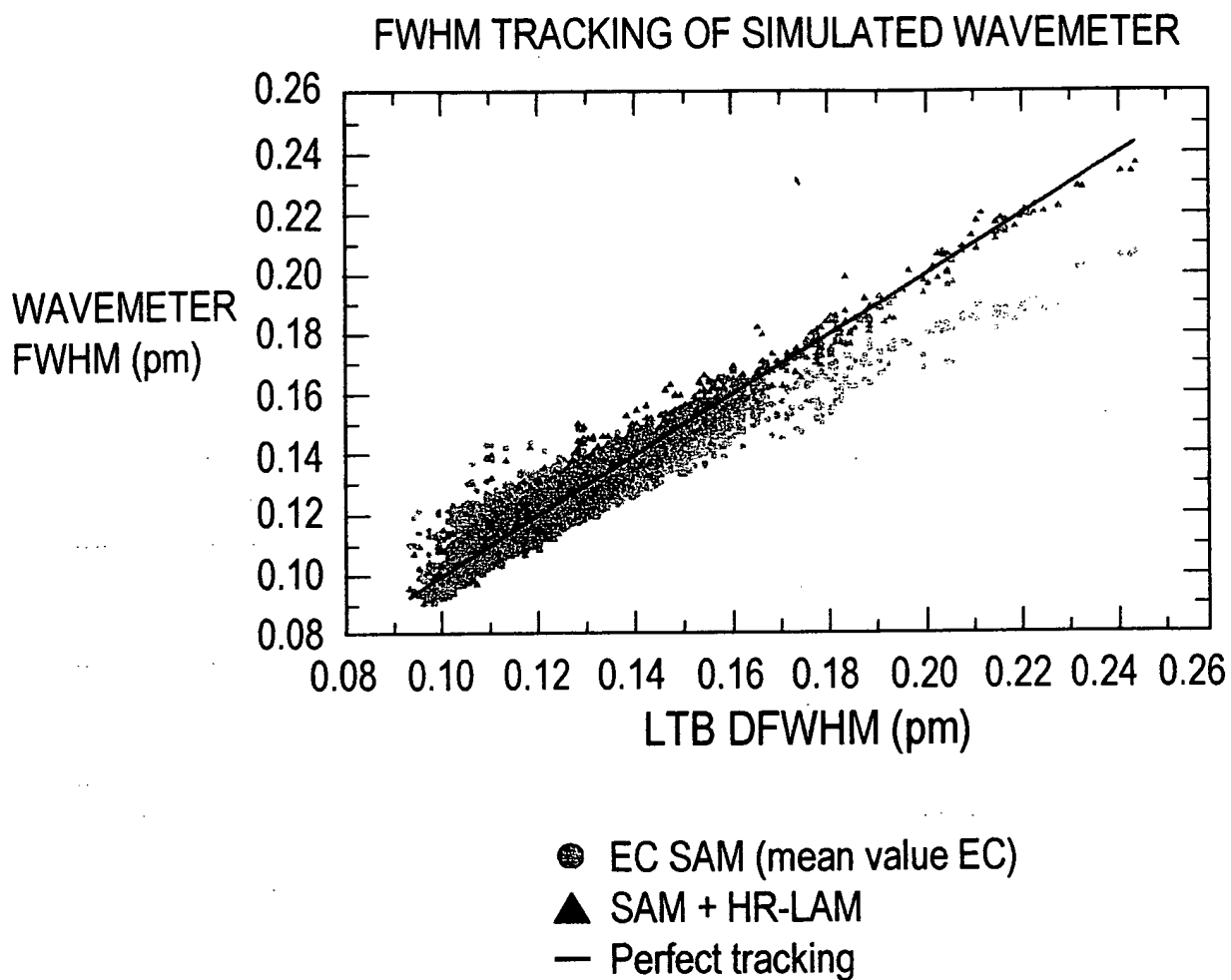Weighting:
Z   No weighting

Chi^ 2/DoF = 0.00008
R^ 2   = 0.89623

A 0.64495 ±0.0166
B 0.20797 ±0.01105
C 0.22983 ±0.00719

FIG. 1

FWHM TRACKING OF SIMULATED WAVEMETER

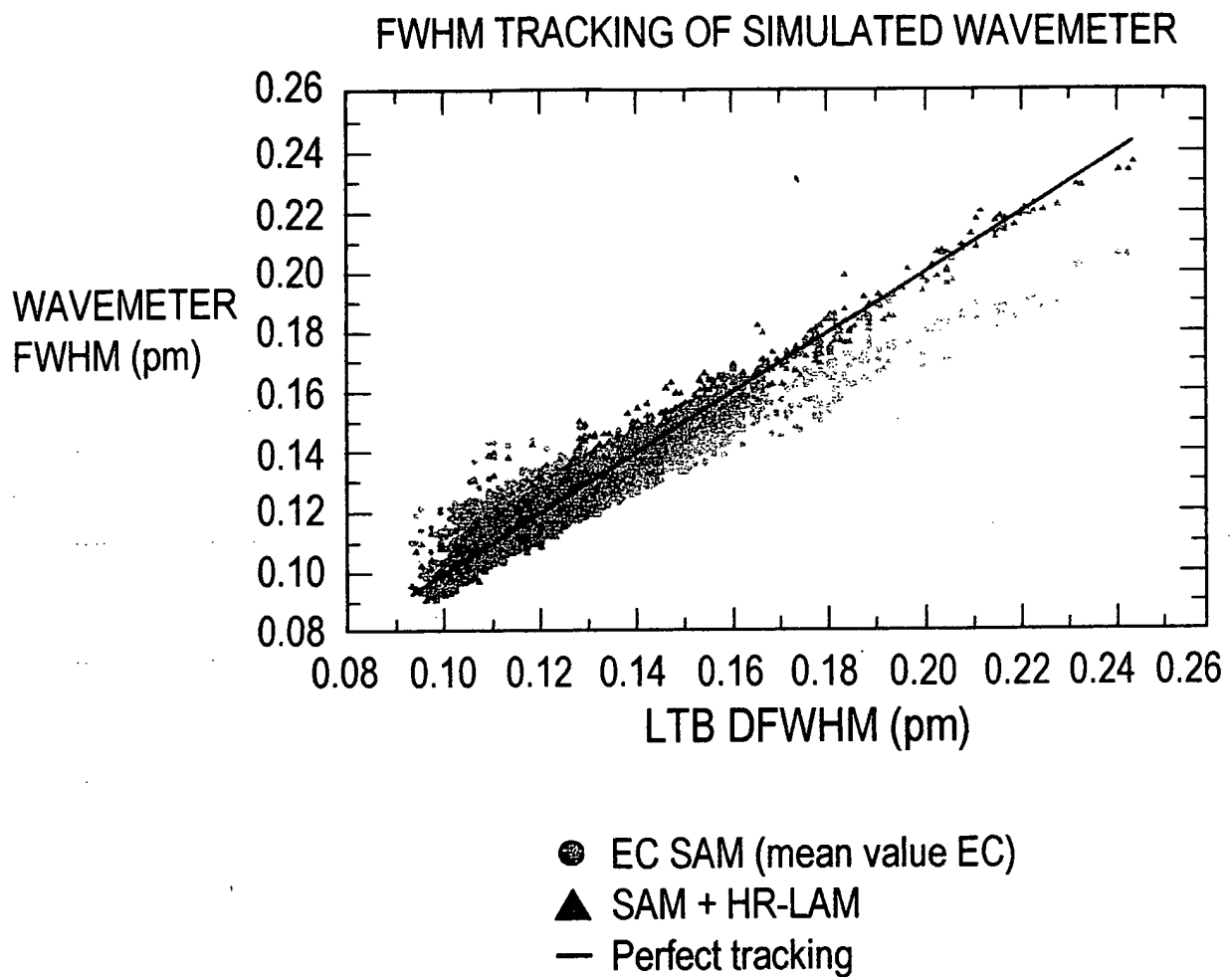EC SAM (mean value EC)
▲ SAM + HR-LAM
— Perfect tracking

SAM: 0.12 pm FWHM bandpass
20 pixels in FWHM
800 pixel inspection range

HRLAM: 0.70 pm FWHM bandpass
20 pixels in FWHM
800 pixel inspection range

6 pilot XLA-130 lasers
4814 spectra from Bandwidth Resonance scans

FIG. 5

FWHM TRACKING OF SIMULATED WAVEMETER

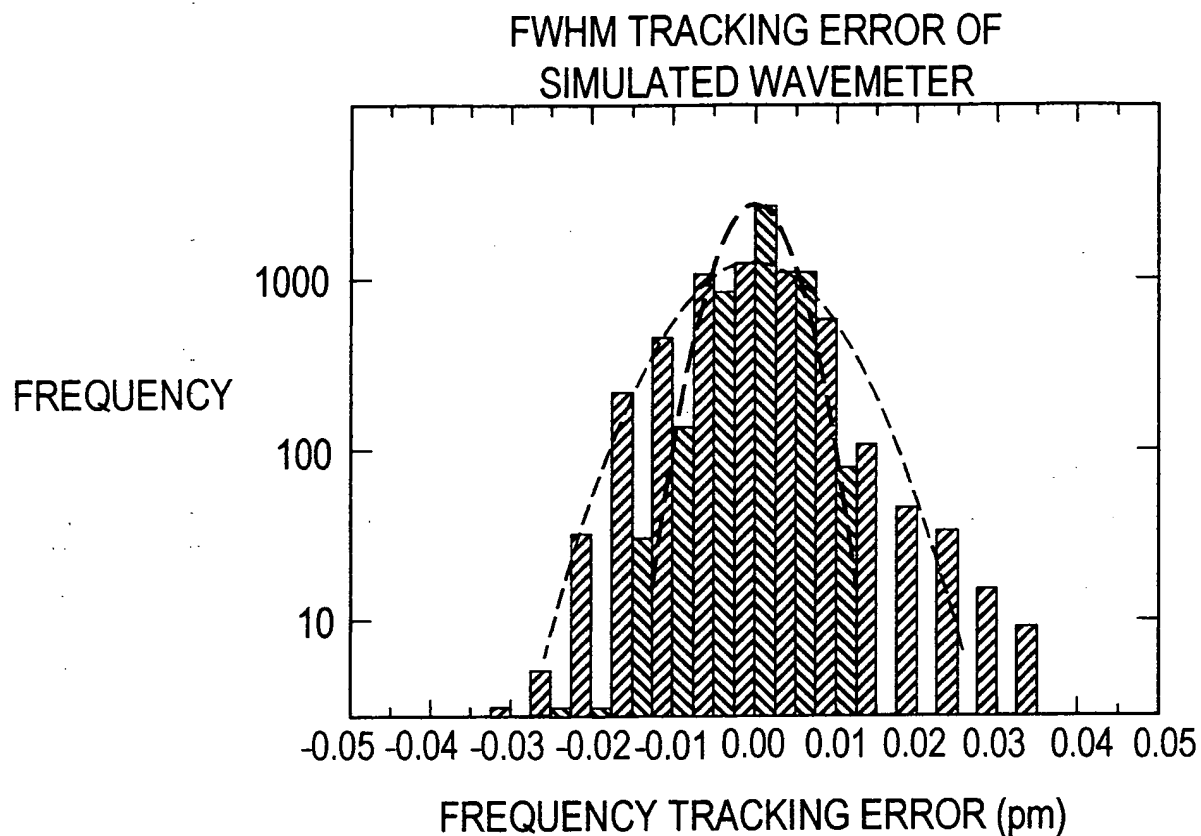● EC SAM (mean value EC)
▲ SAM + HR-LAM
— Perfect tracking

SAM: 0.12 pm FWHM bandpass
20 pixels in FWHM
800 pixel inspection range

HRLAM: 0.70 pm FWHM bandpass
20 pixels in FWHM
800 pixel inspection range

6 pilot XLA-130 lasers
4814 spectra from Bandwidth Resonance scans

FIG. 5

FWHM TRACKING ERROR OF SIMULATED WAVEMETER

FREQUENCY

1000

100

10

-0.05 -0.04 -0.03 -0.02 -0.01 0.00 0.01 0.02 0.03 0.04 0.05

FREQUENCY TRACKING ERROR (pm)

▨ TRACKING RESIDUALS EC SAM VARIANCE = 7.9 fm
▧ TRACKING RESIDUALS SAM + HR LAM VARIANCE = 3.9 fm

SAM: 0.12 pm FWHM bandpass
20 pixels in FWHM
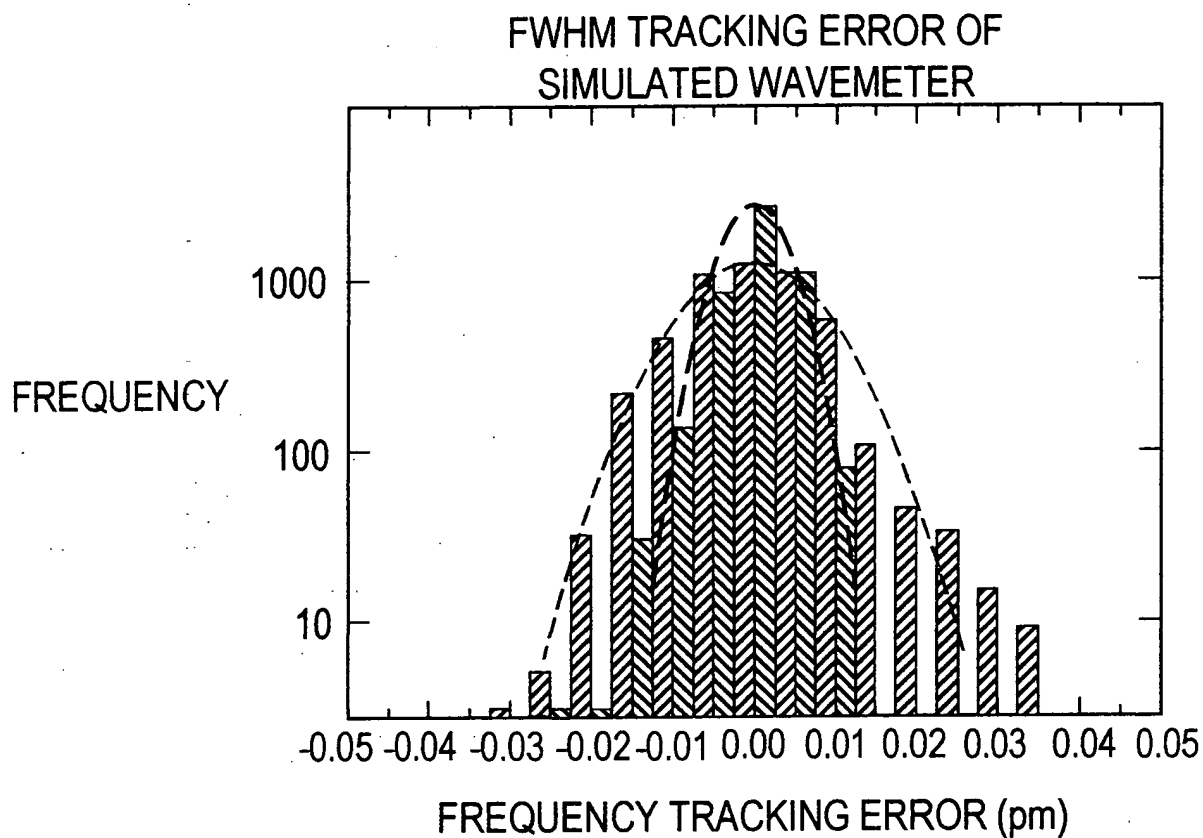800 pixel inspection range

HRLAM: 0.70 pm FWHM bandpass
20 pixels in FWHM
800 pixel inspection range

6 pilot XLA-130 lasers
4814 spectra from Bandwidth Resonance scans

FIG. 6

FWHM TRACKING ERROR OF SIMULATED WAVEMETER

FREQUENCY

1000

100

10

-0.05 -0.04 -0.03 -0.02 -0.01 0.00 0.01 0.02 0.03 0.04 0.05

FREQUENCY TRACKING ERROR (pm)

TRACKING RESIDUALS EC SAM VARIANCE = 7.9 fm
TRACKING RESIDUALS SAM + HR LAM VARIANCE = 3.9 fm

SAM: 0.12 pm FWHM bandpass
20 pixels in FWHM
800 pixel inspection range

HRLAM: 0.70 pm FWHM bandpass
20 pixels in FWHM
800 pixel inspection range

6 pilot XLA-130 lasers
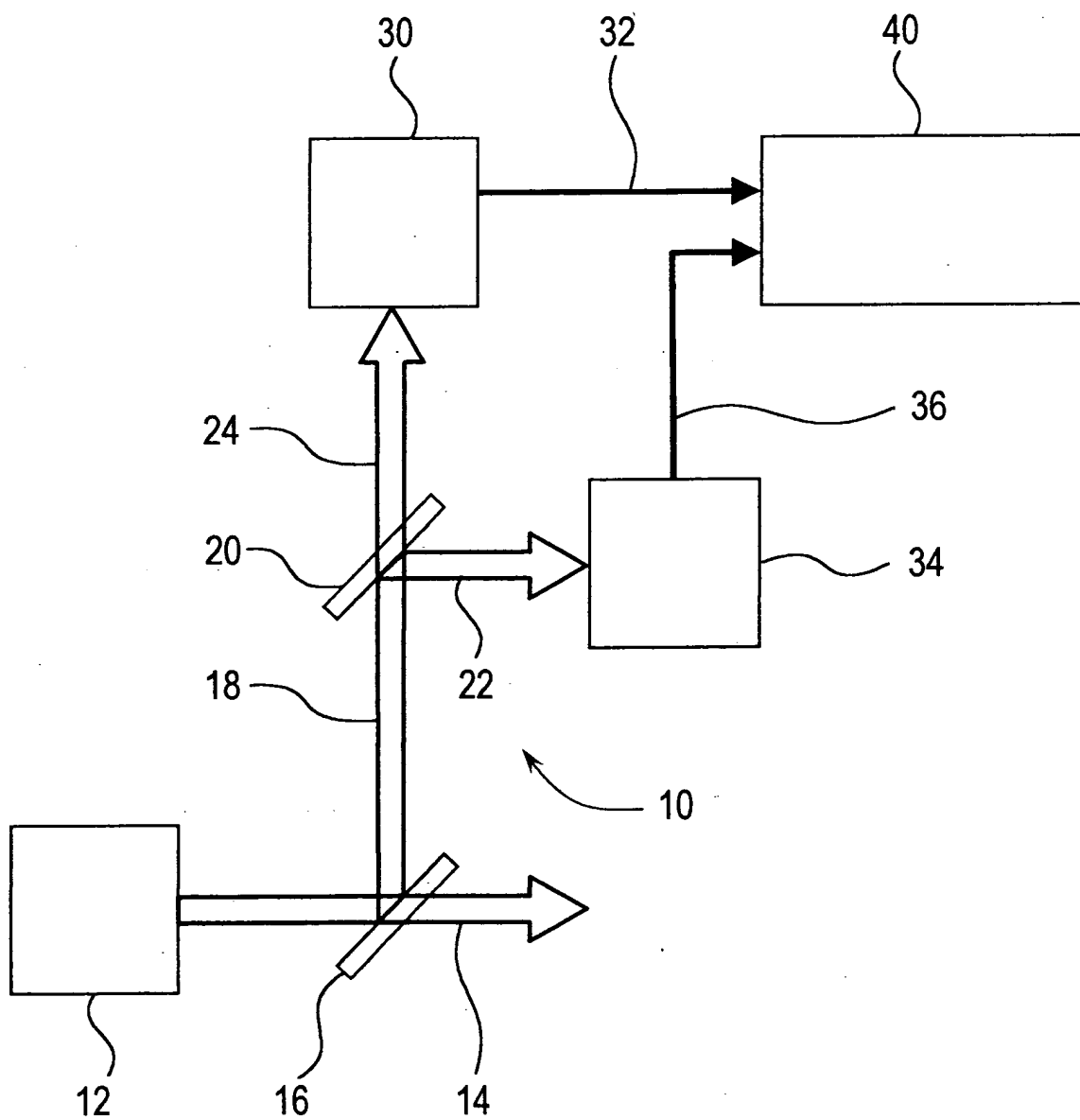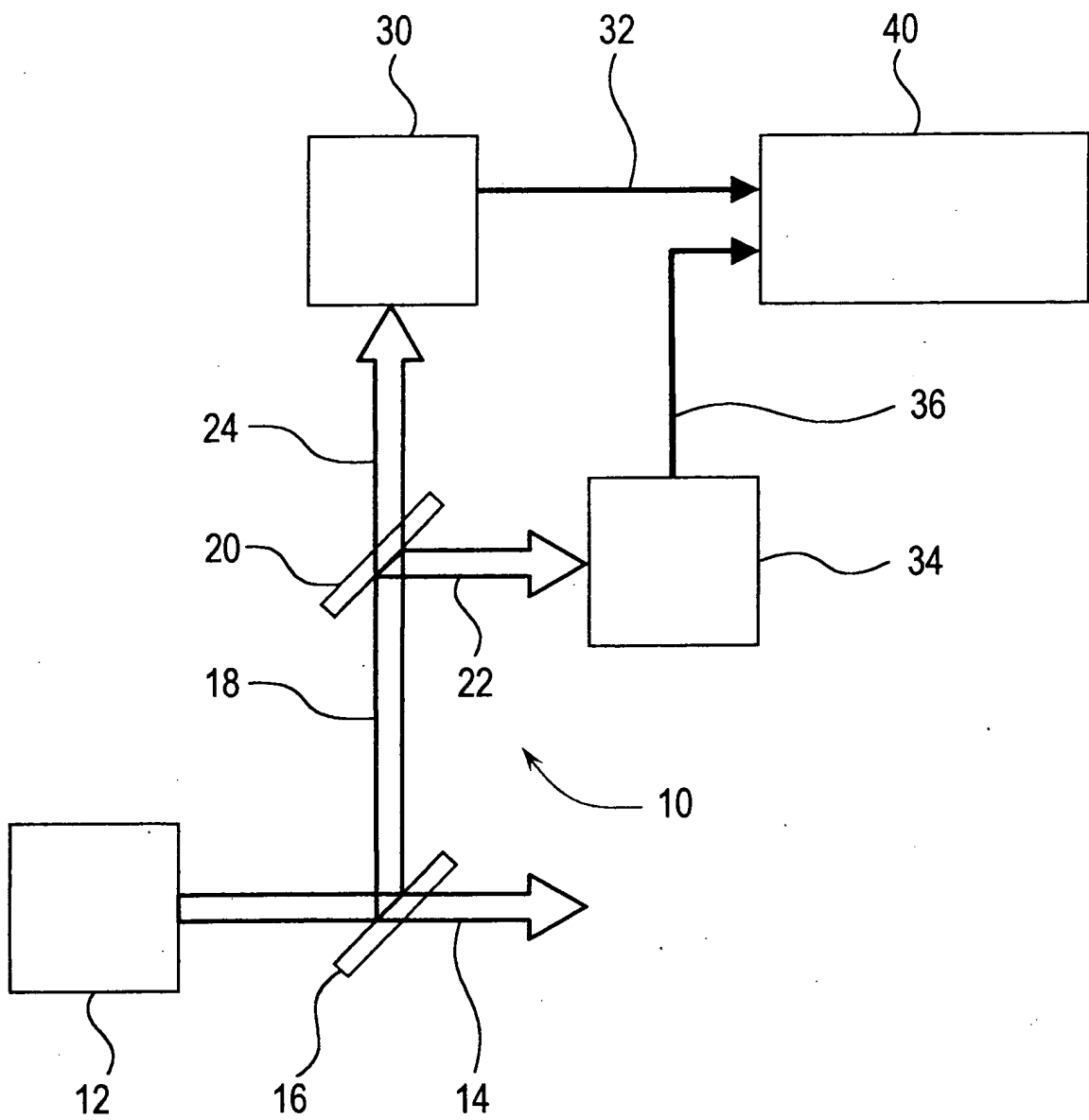4814 spectra from Bandwidth Resonance scans
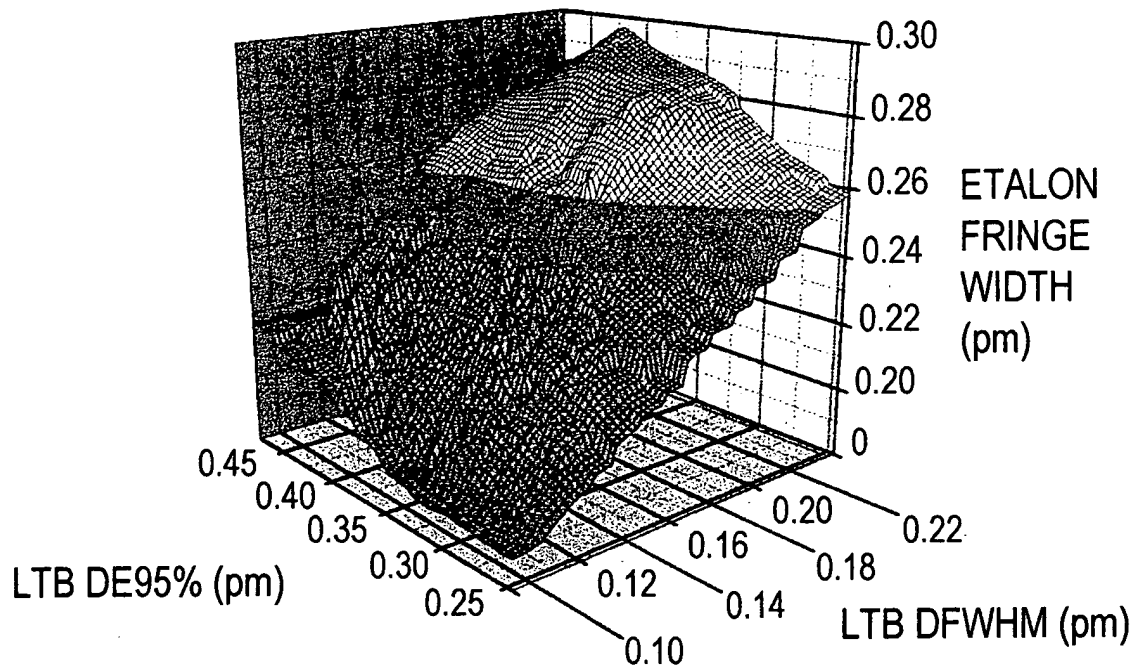
FIG. 6

FIG. 4

FIG. 4

SAM Tracking Simulation 0.12 pm/20 pixel Bandpass

Data: Data5_SAM
Model: 3Dplane
Equation: A*x + B*y + C
Weighting:
Z   No weighting

Chi^ 2/DoF = 7.8249E-6
R^ 2   = 0.95716
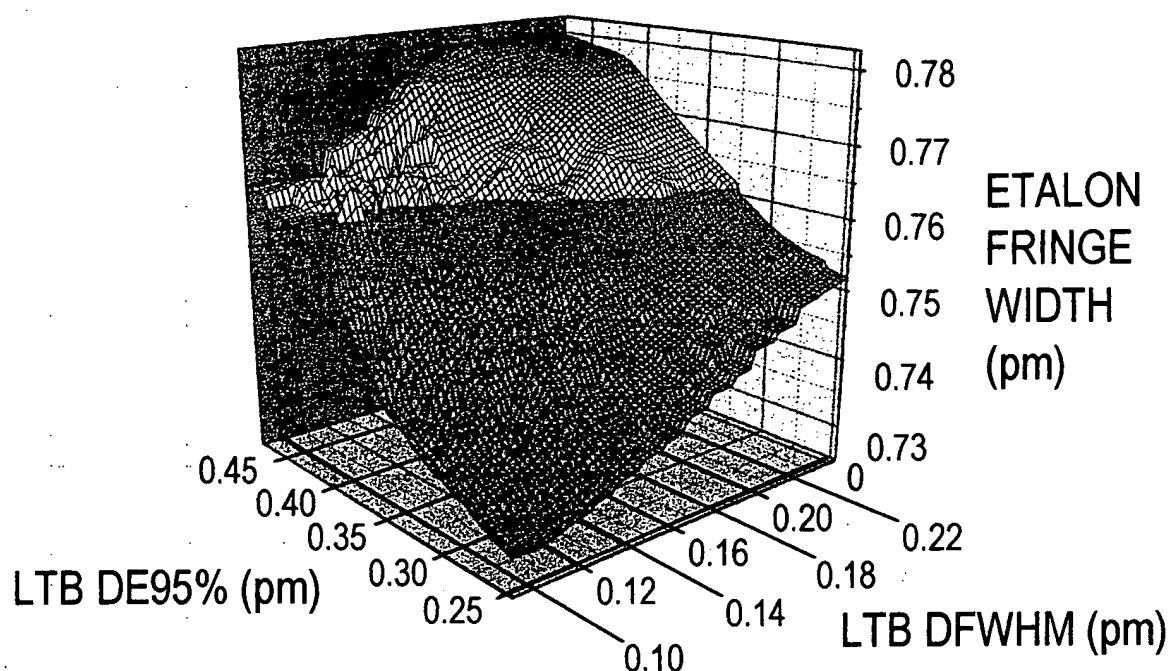
A 0.66704 ±0.00221
B 0.08951 ±0.00079
C 0.10172 ±0.00039

FIG. 2

HiRes LAM Tracking Simulation 0.7 pm/20 pixel Bandpass

Data: Data5_HRLAM
Model: 3Dplane
Equation: A*x + B*y + C
Weighting:
Z   No weighting

Chi^ 2/DoF = 2.0666E-6
R^ 2   = 0.97507

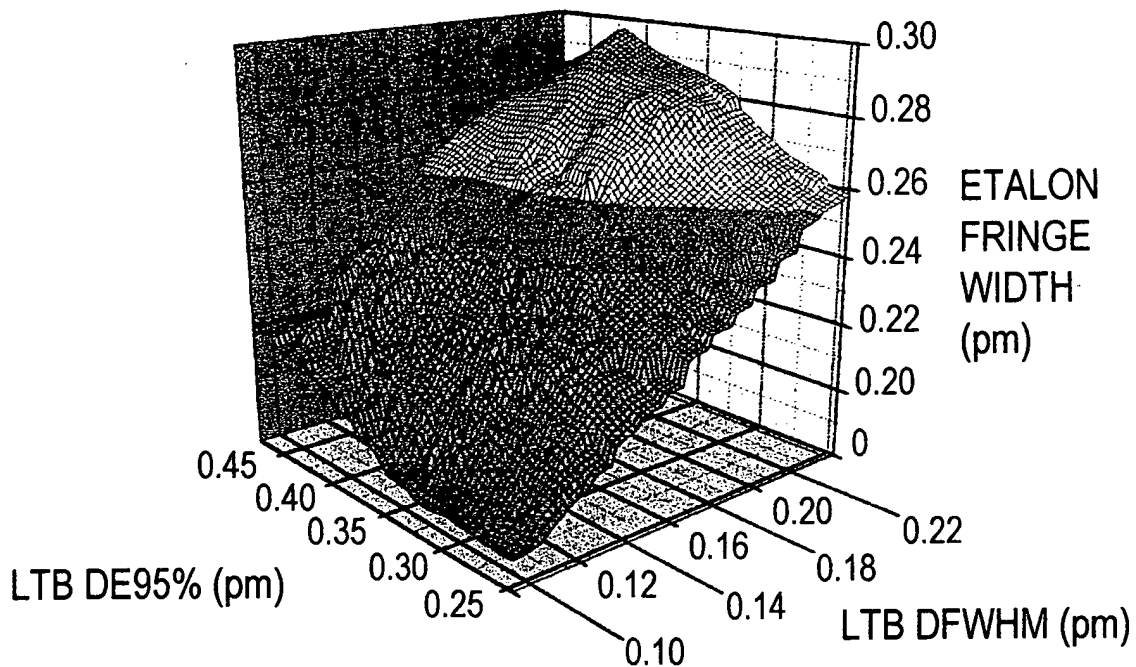A 0.14483 ±000114
B 0.16575 ±0.00041
C 0.67263 ±0.0002

FIG. 3

SAM Tracking Simulation 0.12 pm/20 pixel Bandpass

Data: Data5_SAM
Model: 3Dplane
Equation: A*x + B*y + C
Weighting:
Z   No weighting

Chi^ 2/DoF = 7.8249E-6
R^ 2   = 0.95716
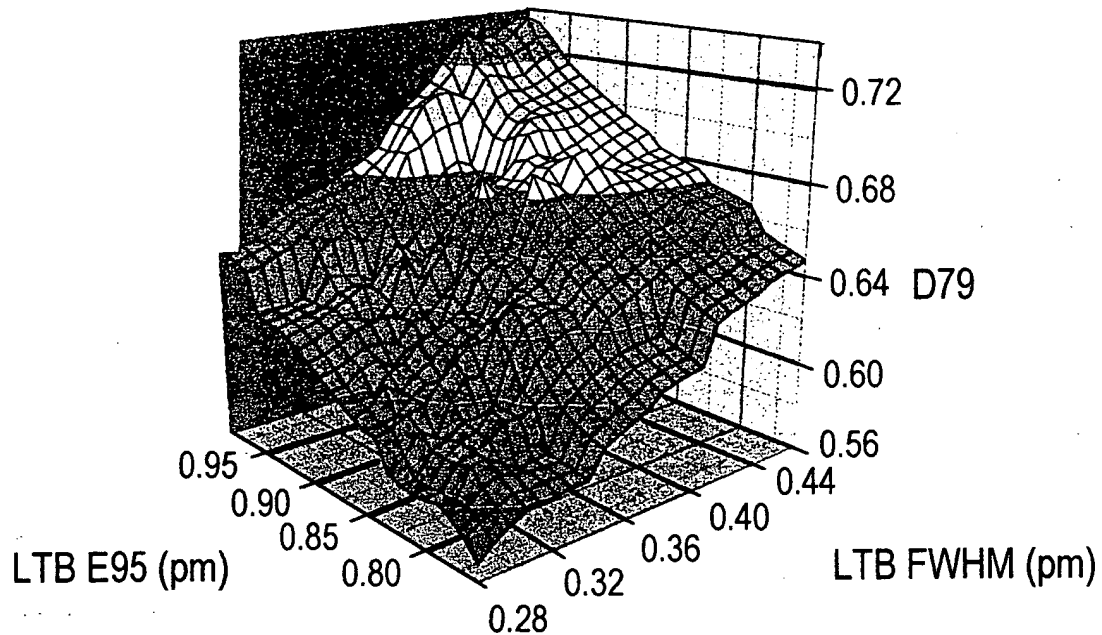
A 0.66704 ±0.00221
B 0.08951 ±0.00079
C 0.10172 ±0.00039

FIG. 2

Avg Behavior of D79 (28-36)/380 kPa
Correlation gridding, WM5645 ultralow wedge etalon

Data: Data2_D79
Model: 3Dplane
Equation: A*x + B*y + C
Weighting:
Z   No weighting

Chi^ 2/DoF = 0.00008
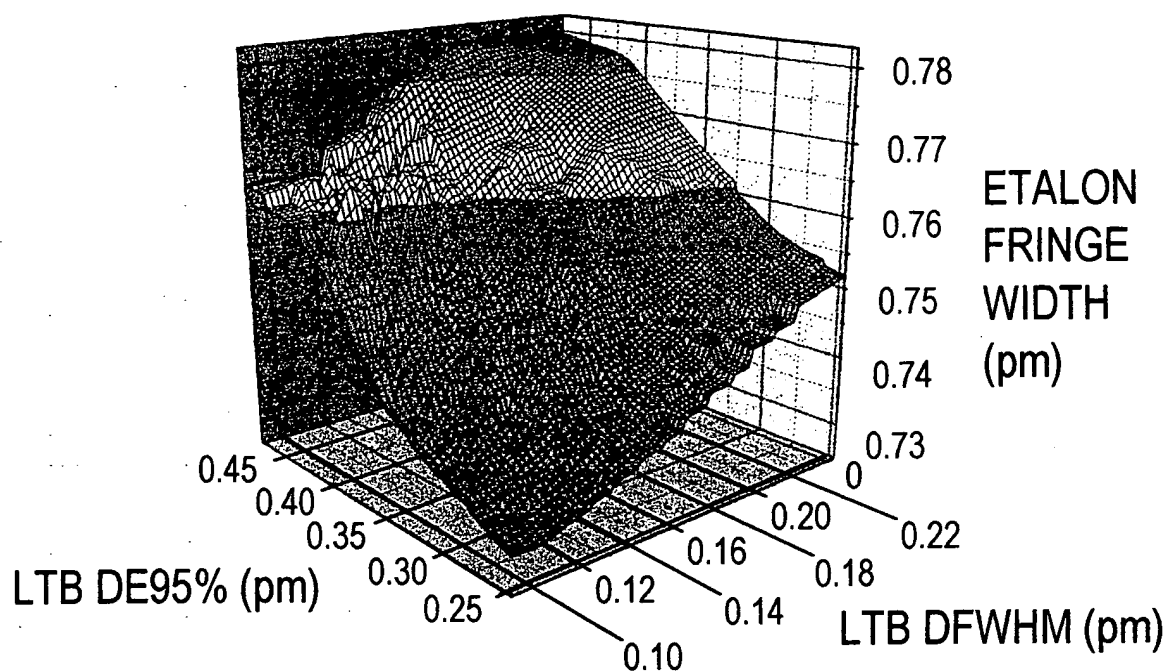R^ 2   = 0.89623

A 0.64495 ±0.0166
B 0.20797 ±0.01105
C 0.22983 ±0.00719

FIG. 1

HiRes LAM Tracking Simulation 0.7 pm/20 pixel Bandpass

Data: Data5_HRLAM
Model: 3Dplane
Equation: A*x + B*y + C
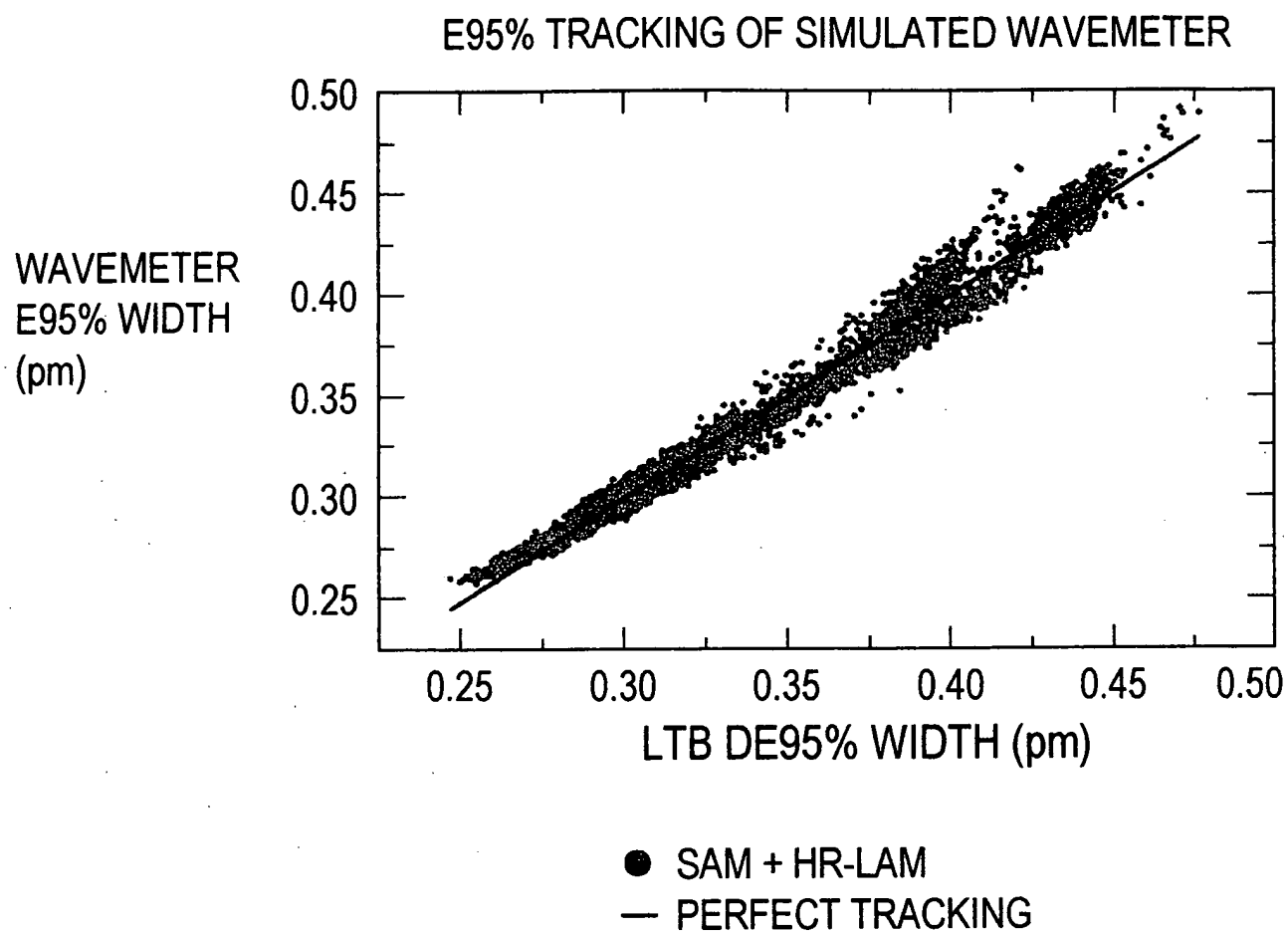Weighting:
Z   No weighting

Chi^ 2/DoF = 2.0666E-6
R^ 2   = 0.97507

A 0.14483 ±000114
B 0.16575 ±0.00041
C 0.67263 ±0.0002

FIG. 3

E95% TRACKING OF SIMULATED WAVEMETER

● SAM + HR-LAM
— PERFECT TRACKING

SAM: 0.12 pm FWHM bandpass
20 pixels in FWHM
800 pixel inspection range

HRLAM: 0.70 pm FWHM bandpass
20 pixels in FWHM
800 pixel inspection range

6 pilot XLA-130 lasers
4814 spectra from Bandwidth Resonance scans

FIG. 7

E95% TRACKING OF SIMULATED WAVEMETER

WAVEMETER
E95% WIDTH
(pm)

0.50
0.45
0.40
0.35
0.30
0.25

0.25   0.30   0.35   0.40   0.45   0.50
LTB DE95% WIDTH (pm)

● SAM + HR-LAM
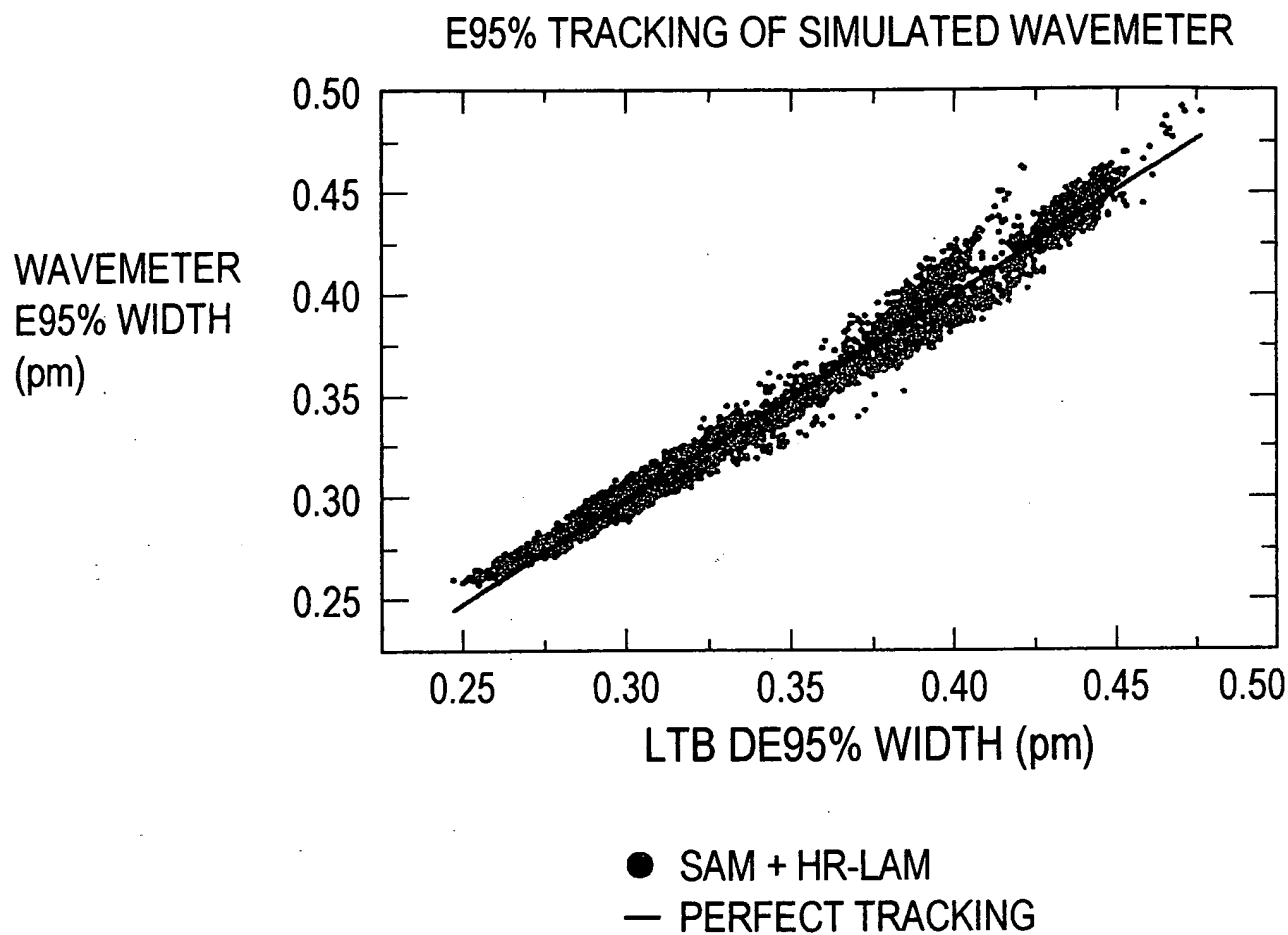— PERFECT TRACKING

SAM: 0.12 pm FWHM bandpass
20 pixels in FWHM
800 pixel inspection range

HRLAM: 0.70 pm FWHM bandpass
20 pixels in FWHM
800 pixel inspection range

6 pilot XLA-130 lasers
4814 spectra from Bandwidth Resonance scans

FIG. 7

E95 TRACKING ERROR OF SIMULATED WAVEMETER

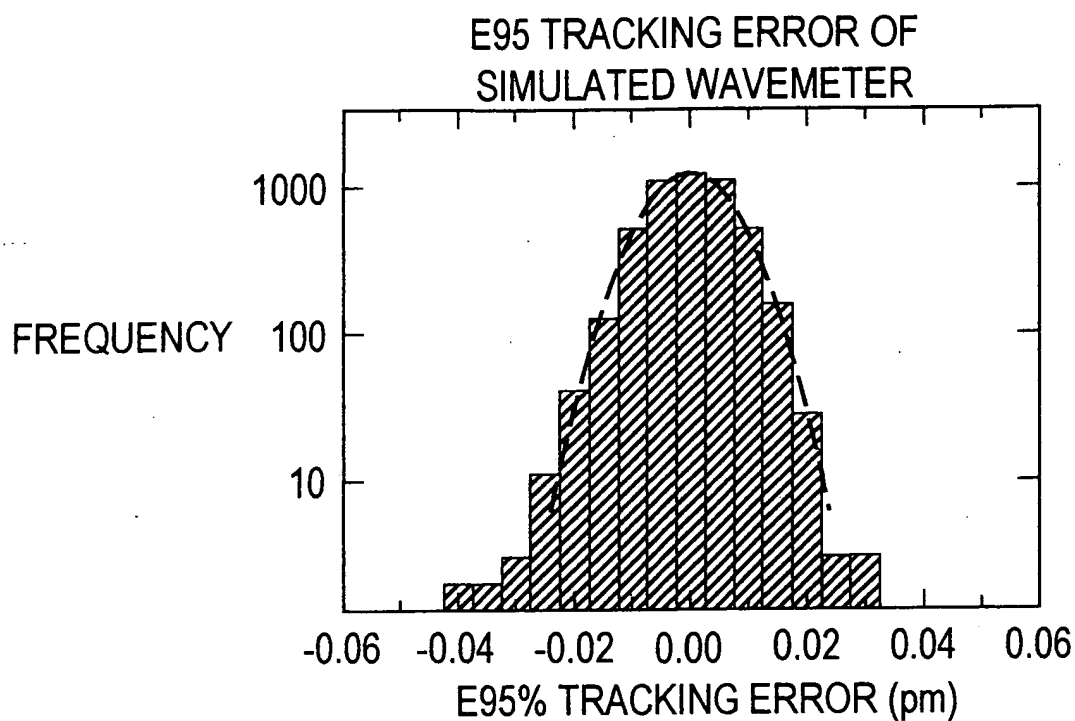TRACKING RESIDUALS SAM + HR LAM VARIANCE = 7.3 fm

SAM: 0.12 pm FWHM bandpass
20 pixels in FWHM
800 pixel inspection range

HRLAM: 0.70 pm FWHM bandpass
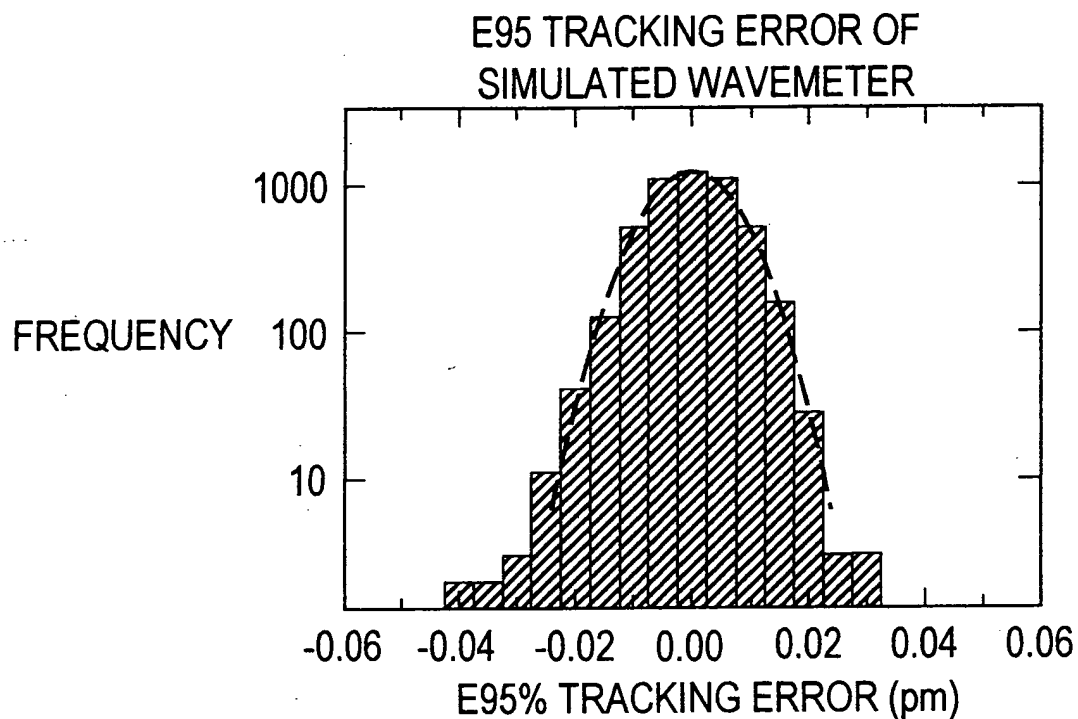20 pixels in FWHM
800 pixel inspection range

6 pilot XLA-130 lasers
4814 spectra from Bandwidth Resonance scans

FIG. 8

E95 TRACKING ERROR OF SIMULATED WAVEMETER

FREQUENCY

1000

100

10

-0.06 -0.04 -0.02 0.00 0.02 0.04 0.06

E95% TRACKING ERROR (pm)

▨ TRACKING RESIDUALS SAM + HR LAM VARIANCE = 7.3 fm

SAM: 0.12 pm FWHM bandpass
20 pixels in FWHM
800 pixel inspection range

HRLAM: 0.70 pm FWHM bandpass
20 pixels in FWHM
800 pixel inspection range

6 pilot XLA-130 lasers
4814 spectra from Bandwidth Resonance scans

FIG. 8